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MARCH 19, 1949

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

Top Young Scientists

See Page 179

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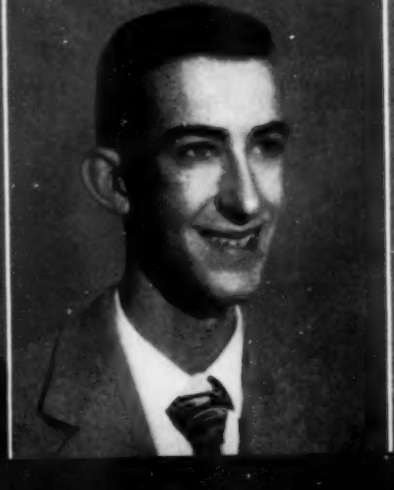

GENERAL SCIENCE

Top Science Scholarships

Surveyor of shellfish life off Eastern coast, Dwight W. Taylor, received $2,800 award. Mathematician, Caroline S. Littlejohn, won the $2,000 scholarship.

See Front Cover

➤ A CALIFORNIA high school boy who discovered more than 70 types of shellfish new to Nantucket Island, off the coast of Massachusetts, is the nation's top young scientist of 1949.

He is Dwight W. Taylor, 17, of Altadena, Calif., a senior at Webb School, Claremont, Calif. A Westinghouse Grand Science Scholarship of $2,800 was awarded the youth at the climax of the five-day Science Talent Institute in Washington for winners of the Eighth Annual Science Talent Search.

Runner-up, and winner of a $2,000 scholarship, is Caroline S. Littlejohn, 16, of Classen Senior High School in Oklahoma City. The two top scholarship winners are shown on this week's cover of the SCIENCE NEWS LETTER.

Eight participants received scholarship awards of $400 each, and 30 were given $100 scholarships. All winners will enter approved colleges and universities of their own choice next fall. The Science Talent Search for the Westinghouse Science Scholarships is conducted each year by Science Clubs of America, administered by Science Service.

Mr. Taylor made his choice of a life career very early, as scientists often do; he intends to be a paleontologist, or researcher into the story of ancient life on the earth. He has already made a promising beginning, for he has studied both living and fossil shellfish in several widely separated places.

His special study was made during three summers on the island of Nantucket and in surrounding waters down to a depth of 90 feet. He collected and classified all snails, clams, oysters and related species, studying them with special reference to their ecology, or environmental relations. Up to the time he began his work, only 46 molluscan species were known from Nantucket; he increased the list to 120. He is already a member of the "grown-up" scientific society specializing on mollusks, the American Malacological Union.

Despite the advanced study which he has been able to carry on as a 'teen-ager, Mr. Taylor is neither a bookworm nor a single-tracker. He likes sports, especially tennis and badminton, is a member of the staffs of both his school paper and annual, and collects stamps as well as shells. He plans to attend the University of Michigan.

Miss Littlejohn looks forward to a career as a theoretical physicist, where she can make use of her already highly developed mathematical talents. In the essay which she submitted as part of the requirements of the Science Talent Search, she posed an unsolved problem in the theory of relativity, having to do with the "clumped" distribution of matter in space. On her own, she studied differential and integral calculus outside of school, to enable herself to make more rapid progress in physics and physical chemistry.

Despite this intensive interest in mathematics and physics, Miss Littlejohn has found time for independent studies in the outdoor sciences. She has collected plants and insects, made field studies of birds, and carried out projects of her own on the comparative anatomy of mammals, birds, reptiles and fish.

First among the winners of the $400 scholarships, and named alternate to receive the $2,000 scholarship if the winner is unable to use it, is Pierre E. Conner, Jr., 16, of Cathedral High School, Lafayette, La. His ambition is for a career in medical research. The study he conducted in connection with his participation in the Science Talent Search, however, was in physics. He experimented with a Hilsch tube, a recently invented, paradoxical contrivance that blows hot air out of one end and cold air out of the other. He suggests that a practical use of this principle might be to supply cool air for airplane cabin ventilations, and at the same time produce heated air for de-icing the wings.

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GENERAL SCIENCE

Winners of Scholarships

GRAND SCHOLARSHIP OF $2,800

Taylor, Dwight Willard, Claremont, Calif.

$2,000 SCHOLARSHIP AND ALTERNATE

Littlejohn, Caroline Stuart, Oklahoma City, Okla.

ALTERNATE

Conner, Pierre Euclide, Jr., Lafayette, La.

SCHOLARSHIPS OF $400

Barr, Thomas Calhoun, Jr., Nashville, Tenn.
Conner, Pierre Euclide, Jr., Lafayette, La.
Kimball, John Ward, Andover, Mass.
Landau, Henry Jacob, New York, N. Y.
Martin, Thomas Francis, Cleveland, Ohio
Reinhardt, Nicholas, Terrace Park, Ohio
Shugart, Howard Alan, Glendale, Calif.
Victor, Ursula Vivian, Forest Hills, N. Y.

ALTERNATES

1st alt. Goldman, Alan Joseph, Brooklyn, N. Y.
2nd alt. Bauman, Norman, Brooklyn, N. Y.

SCHOLARSHIPS OF $100

Bohrer, Vorsila Laurene, Arlington Heights, Ill.
Harmon, Margaretta Vanya, Philadelphia, Pa.
Jaburg, Erika Elizabeth, New York, N. Y.
Johnson, Laveta Audrey, Oak Park, Ill.
Oels, Helen Claire, Philadelphia, Pa.
Wagman, Anne, Forest Hills, N. Y.
Zalutsky, Rosalyn Edith, Schenectady, N. Y.
Anigstein, Robert, Galveston, Texas
Bach, Michael Klaus, Forest Hills, N. Y.
Bauman, Norman, Brooklyn, N. Y.
Blattner, Robert James, Shorewood, Wis.
Boldt, Elihu Aaron, New Brunswick, N. J.
Bray, Richard Arthur, Eugene, Ore.
Brett, Jack Samuel, New York, N. Y.
Brilliant, Martin Barry, New York, N. Y.
Clough, Garrett Conde, Newburgh, N. Y.
Dell, Fritz, Galena, Ohio
George, Myron Don, Topeka, Kans.
Gilbert, Walter, Washington, D. C.
Goldman, Alan Joseph, Brooklyn, N. Y.
Kaufman, John David, Grinnell, Iowa
Kriegsman, William Edwin, Scarsdale, N. Y.
Merz, Edwin Henry, Jr., St. Louis, Mo.
Nelson, Roger Hugh, Mt. Pleasant, Utah
Plantz, Charles Arthur, Pittsburgh, Pa.
Shiman, Paul Leonard, Millburn, N. J.
Stout, George Hubert, St. Louis, Mo.
Thorp, Edward Oakley, Lomita, Calif.
Werntz, Carl Weber, Washington, D. C.
Winston, Herbert, Forest Hills, N. Y.

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TOP EIGHT—Left to right: The top winners are congratulated by Watson Davis, Harlow Shapley, and Basil O'Connor. The group is shown the 60-inch cyclotron of the Department of Terrestrial Magnetism, Carnegie Institution of Washington, by Dr. Richard Roberts. Dr. Hazel K. Stiebeling, U.S.D.A., talking to some of the winners Device for showing the strain patterns in plastic models was demonstrated by Dr. Richard C. Hitchcock of Westinghouse Electric Corp. Alternate to the $2,000 scholarship, Pierre E. Conner, Jr. Winners of $400 scholarships are: Pierre E. Conner, Jr., Thomas C. Barr, Jr., John W. Kimball, Henry J. Landau, Thomas F. Martin, Nicholas Reinhardt, Howard A. Shugart, and Ursula V. Victor.

NUTRITION

Eat Well for Long Life

➤ FORTY high school seniors getting set for careers in science were reminded that they had better drink plenty of milk and eat lots of green and yellow vegetables and fruits containing vitamin C.

The 40 boys and girls are the winners in the eighth annual Science Talent Search conducted by Science Clubs of America for Westinghouse Science Scholarships. The good diet reminder came from Dr. Hazel K. Stiebeling, chief of the Bureau of Human Nutrition and Home Economics, U. S. Department of Agriculture.

With another four to seven years of study ahead, the scientifically talented boys and girls will have passed a third of an average life span before they begin their professional careers, Dr. Stiebeling pointed out. Their highest opportunities may not come until they are 40 or 50 years old.

Best hope for gaining extra years for achievement at that prime period of life lies in following what is now known about nutrition, she suggested.

Rats have been given much more than a 10% increase in the prime of life by a diet containing two to four times the amount of calcium, vitamin A and riboflavin considered "adequate," she reported. But, she pointed out, "we haven't yet given the human animal a chance to prove its potentiality."

Scientists today know that the human diet must supply some 40 chemical substances in order to have proper functioning of the body. These include eight to 10 amino acids and 12 or more vitamins as well as inorganic salts of various minerals. But just how many nourishing materials are needed and in what amounts and proportions are not yet known. The 40 Science Talent Search winners, she suggested, may help to solve some of these and the other unsolved problems of nutrition.

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Letters To The Editor

Market for Fish Meal

➤ THE greatest market for fish meal, at the present time, including menhaden meal, (SNL, Feb. 26, p. 131) is in the animal and poultry feeding industry. We have never been able to obtain statistics indicating the relative proportion entering the fertilizer and animal feeding industries.—A. W. Anderson, Chief, Branch of Commercial Fisheries, Washington, D. C.

In Elephants' Defense

Referring to your article "Elephants Suspected of Spreading Tuberculosis", SNL, Jan. 22, p. 56, I would say the reverse to be true. From the stated facts it would seem that some dirty, stinking human must have coughed in the poor pachyderm's face. —Walter L. Hall, bacteriology instructor, John Muir College, Pasadena, Calif.

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HOBBIES BRING HONORS—Read left to right: Dwight Taylor shows distribution of water mollusks; Caroline Littlejohn, representative Okla. insects; Richard Bray, minerals; Edwin Merz, Jr., influence of two compounds on evaporation of water; Ursula Victor, zoophagy in a carnivorous water plant; Thomas Barr, Jr., study of caves, cave animals and plants; Carl Werntz, reflector telescope; Margaretta Harmon, homebuilt Wimshurst electrostatic generator; Nicholas Reinhardt, homemade apparatus for analyzing motions of rotating or vibrating objects; Herbert Winston, tumor in hybrid tropical fish; Henry Landau, graphs to illustrate integraph; Roger Nelson, three color separation camera and photographic process.

Question Box

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PHYSICS

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Photographs: Cover, p. 178, p. 181, Fremont Davis; p. 183, University of California.

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CAVE ECO

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CANCEROUS HYBRIDS
CANCEROUS HYBRIDS

COLOR-TRIOL PROJECTOR

DENTISTRY

Fluorine Precautions

Fluoride tablets, given to children as a preventive for tooth decay, must be taken in dosages prescribed by a doctor or dentist to avoid mottling the enamel on teeth.

➤ IF YOU are giving fluoride tablets to your children in the hope of protecting their teeth from decay, be sure to follow the doctor's or dentist's directions about the dosage. And don't leave the bottle around where the youngsters can help themselves.

This advice comes from Dr. F. J. McClure, of the U. S. National Institute of Dental Research, U. S. Public Health Service.

There is a relatively narrow margin between the amount of fluorine that may help prevent tooth decay and the amount that causes the ugly mottled enamel condition of teeth, he points out in a report prepared at the request of the American Medical Association and appearing in its JOURNAL (March 12).

For preventing tooth decay, best results are associated with one part per million of fluorine in the drinking water. But one and one-half parts per million or slightly more of fluorine in drinking water is the beginning of mottled enamel.

A "great number" of fluoride-containing tablets for daily consumption are now on the market, Dr. McClure reports. The object is to give children fluoride in this way instead of through fluorinated drinking water. They should not be used, he warns, where the drinking water contains from one-half to one part per million of fluorine.

Whether giving fluorine in this way will actually protect teeth against decay has not yet been determined. The idea has possibilities, Dr. McClure believes.

Drinking water is being fluorinated in at least nine cities: Grand Rapids, Mich.; Newburgh, N. Y.; Brantford, Ont., Canada; Midland, Mich.; Sheboygan and Madison, Wis.; Evanston, Ill.; Ottawa, Kans.; and Marshall, Texas. So far there is no conclusive evidence from these cities that the fluorination is doing any good, or, as Dr. McClure puts it, that "fluorine is an essential element for dental health." But the fluorination programs continue in the hope that in time evidence for or against will be forthcoming.

The idea that foods grown in areas where the local water is high in fluorine will also be high in fluorine content is false, Dr. McClure declares.

Neither can farmers expect to get more fluorine into their cows' milk by adding extra fluorine to the cows' feed or drinking water.

The tea leaf and certain sea foods are high in fluorine but in general no raw foods, Dr. McClure states, can be implicated as either causing mottled enamel from excessive fluorine or preventing tooth decay through their fluorine content.

Certain foods may pick up small amounts of fluorine when cooked in fluorine waters.

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STS Winner Writes

"For the past three years, I have spent the summers on Nantucket Island, Mass. During that time, I made a distributional and ecologic study of the mollusks of the area.

"The purposes of the study were as follows:

(1) To correlate the distributions of the various species with the ecologic zones they occupy.

(2) To ascertain to what region Nantucket is most nearly related in regard to the mollusks.

(3) To determine the extent of the influence of the Gulf Stream on the molluscan fauna.

(4) To prepare the way for a comparison of the Recent and Pleistocene shells.

(5) To increase the scanty list of mollusks already known from the island.

"Collecting in the different habitats was done in a variety of ways to ensure as complete a faunal picture as possible. Among the equipment used were nets, shovels, rakes, screens of various mesh-sizes, clammer's tongs, and dredges. I did not find all the species previously reported from Nantucket, but the methods used probably gave a fair sample of the populations existing when I collected. Since some flux was observed over the three-year period, it seems possible that the forms I did not find are not now present in as large numbers as they have been.

"Prior to this study, 46 species were known recent from the island, as compared to 66 in the Pleistocene. My collecting has increased the recent list to 120 species. The obtainment of accurate results from a comparison between the two is now made more certain."—From the essay of Dwight W. Taylor.

MEDICINE

Dangerous Cough Remedy

➤ DISCOVERY that a urethane-containing cough syrup, dangerous to users because it might make them easy prey to pneumonia, had gone on the market was due to the off-duty alertness of a U. S. Food and Drug Administration official.

Going into a couple of drug stores in New York City looking for a special kind of razor blade for himself, he noticed the cough syrup, called "syrup of urethane," displayed on the counters. He remembered the concern at Food and Drug Administration headquarters in Washington over a new drug application for a urethane preparation to be used in treatment of leukemia. So he immediately got in touch with headquarters. After a hectic four days of investigation and consultation with medical scientists, the Food and Drug Administration issued a warning on the cough syrup and ordered its agents in the field to seize all known supplies.

Urethane is a very old drug. It was used 100 years ago as a sedative or hypnotic. But it was not very dependable and was replaced by chloral hydrate. This in turn has been replaced by the barbiturates.

Recently urethane came into use in the treatment of leukemia, cancer-like disease in which there are too many white cells in the blood. Urethane reduces the number of these cells, and gives some relief in a chronic form of leukemia. It does not cure the disease, however.

Its effect on white blood cells is what makes it potentially dangerous as a cough syrup. The patient with a cough needs his white cells to help fight off the infection and guard him against other germs, such as those causing pneumonia.

So far, Food and Drug officials have not heard of any injuries or deaths due to use of the urethane cough syrup. Nor have they had any queries about it from physicians. The reason may be that a history of a cold and cough and the taking of cough syrup before coming to the doctor is the usual picture in pneumonia.

While urethane is known to cut down the abnormal white cells in leukemic patients, its effect on normal white cells in normal persons has not been extensively studied. The danger is considered sufficiently great, however, to warrant the Food and Drug action.

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ELECTRONICS

Electronic Tube Controls Power at High Frequencies

➤ A NEW type of electronic tube, called an electron coupler and developed for the modulation and control of power at the ultra-high frequencies, was revealed in New York to the Institute of Radio Engineers by C. L. Cuccia and J. S. Donal, Jr., of the Radio Corporation of America laboratories, Princeton, N. J.

STS Winner Writes

"Not until the past year have I acquired sufficient mathematical background to approach with any degree of understanding the classical works in mathematical physics. My studies have been for the most part confined to work parallel with Eddington's fine treatise, THE MATHEMATICAL THEORY OF RELATIVITY. *Recently, I have also been studying Weyl's discussion of gravitation and electromagnetic fields in* SPACE—TIME—MATTER, *a translation of his* MATHEMATISCHE ZEITSCHRIFT. *Naturally enough, with my necessarily limited knowledge of physics and higher mathematics, I have as of yet been incapable of much original work. However, there are problems which have occurred to me during my present studies which I have tentatively contemplated as to method of approach, and which I intend to attack in the future, after I have been reinforced by university training in mathematics. . . .*

"After a general study of the various phases in Einstein's work, e.g., the law of gravitation, electro-magnetic phenomena, curvature of space and time, relativity mechanics, and so on, I did some conjecturing on my own account. For one thing, a complete theory of relativity constrains us to produce an expression for the phenomenon of atomicity, that is, the tendency of matter to aggregate into particles, leaving relatively large regions of the universe devoid of matter. To the best of my knowledge no such result has been obtained as yet. This problem intrigues me.—From the essay of Caroline Stuart Littlejohn.

The basic tube consists of an electron gun, an input cavity which is connected to a power source and an output cavity which is connected to a load and a collector. These cavities are adjacent and are tuned to the cyclotron frequency of a magnetic field which is parallel to their axis of alignment. They have the property, when excited, of introducing an alternating electric field normal to the magnetic field. The electron beam passes through both cavities. It absorbs the radio frequency power in the input cavity, and delivers this power to the output cavity and load or to the collector.

The power transfer may be controlled by varying either the beam current or the electron transit time in the output cavity. Electron couplers capable of transferring several hundred watts at 800 megacycles with a power efficiency of 70% have been built and operated, they said.

As an ultra-high frequency modulator tube, the electron coupler is a radical departure from more conventional modulation techniques since it makes the modulation system independent of the power generator, and thus permits the most efficient and practical design of the generator.

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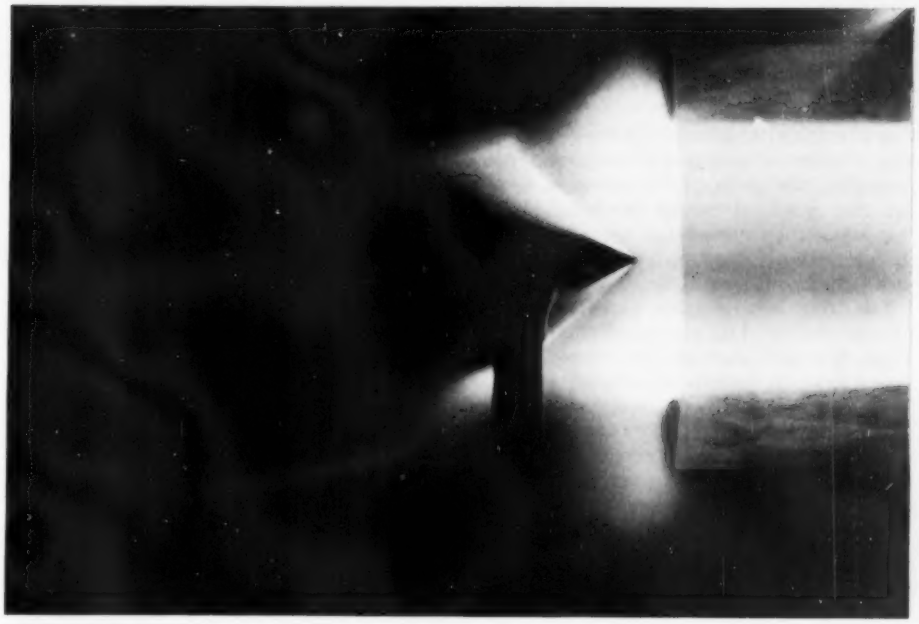

SHOCK WAVES—At 2.6 times the speed of sound, shock waves slant back sharply from edge of wedge-shaped model in test chamber of the University of California's new low pressure supersonic wind tunnel. Pressure at time of photograph was about one ten-thousandth of the atmospheric pressure at sea level.

AERONAUTICS

Near-Vacuum Wind Tunnel

➤ NEAR-VACUUM flight conditions, encountered by rockets from 50 to 80 miles above the earth, are to be studied under man-made conditions in a new type of wind tunnel installed at the University of California at Berkeley.

The ordinary wind tunnels of the world, now countable by the dozens, yield scientific flight data from subsonic to supersonic under conditions at sea level. They give little information of value in determining conditions in the far above atmosphere regions reached by modern rockets. Even the data obtained from rocket-borne instruments sent high aloft are not reliable, because the effects of the conditions on instruments at such altitudes are not accurately known.

These high-up conditions are duplicated in the five-by-seven foot test chamber of the new tunnel by powerful steam jet vacuum pumps. When the vacuum reaches the condition 80 miles above the earth, a molecule in motion in the chamber has a chance of bumping into another molecule every 10 feet. At sea level, molecules in the free air would strike another every one ten-thousandth of an inch.

When the vacuum in the test chamber of this new tunnel has been created, air or gas is poured into a four-inch test section which contains the model. Nitrogen, helium or other gases can be used for special studies. The gases are accelerated to supersonic speeds by a special nozzle.

This tunnel was designed by Dr. R. G. Folsom and E. D. Kane with assistance by other members of the university's staff. In addition to use in determining flight factors in the regions through which rockets will travel, it may also have some industrial applications, such as those concerned with the drying of blood plasma, food processing, and the distillation of vitamins from fish oils.

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GENERAL SCIENCE

Canadian Soldiers Soon To Be in "Well-Dressed" Class

➤ Canadian soldiers of the future will be in the "well-dressed" class, both "on duty" and "off parade."

In addition to smart uniforms, of both winter and summer weight, the soldiers will receive bedroom slippers and broadcloth pajamas between now and the spring of 1950. Bath towels, white cotton handkerchiefs and zippered overshoes are also to be issued to them.

Other new items of clothing planned include black fleece-lined gloves, brown leather waist belts, gabardine raincoats and new gymnasia suits. The soldiers will also benefit immediately by an increase in the present issue of underclothing, shirts, ties and socks.

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INVENTION

Playing Records Non-Stop Possible with New Machine

➤ A PHONOGRAPHIC apparatus that will take a series of ordinary records and run through a whole symphony or opera without the awkward pauses necessitated by changes or turn-overs is the novel invention on which U. S. patent 2,462,435 has just been issued to Robert E. Stanton of Denver.

The basic idea is quite simple. It plays a stack of disks just as any automatic phonograph would. But instead of translating their vibrations directly into sound, it transfers them to a magnetic steel tape record. This runs at a slower rate than the disks, so that there is always enough left over at the end of each disk to fill in the pause until the next one comes on.

After the magnetic tape record has been played it is automatically erased, so that it is always ready for the next recording.

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VOLCANOLOGY

Hawaiian Volcano Due for Eruption within Two Years

➤ YOU CAN expect another eruption of Hawaii's famed volcano, Mauna Loa, "within two years." That is the forecast of the foremost authority on Mauna Loa, Dr. T. A. Jaggar.

Dr. Jaggar cautions that "within two years" may mean only weeks or months.

If the big mountain, biggest in the world in total volume, keeps up its recent record of eruptions, the next one is due about 1951, however.

The last eruption a couple of months ago had the summit crater spilling lava southwest. In both 1933 and 1940, there were similar eruptions. Both times, they were followed in two years by summit eruptions which spilled lava toward the northeast.

Thus, the next eruption, if it follows the pattern, will be in about two years, and spill the lava northeast like the 1935 and 1942 eruptions.

Dr. Jaggar, who has had a distinguished scientific career recording the outbursts of the Hawaiian volcanoes, compares Mauna Loa with a giant beer mug.

Some people think that the lava might drain off through underground connections, but it doesn't. That, Dr. Jaggar explains, is "because a froth rises by expanding gases just like beer."

For use in future eruptions, he urges a laboratory which can be used by scientists to make observations of the first hour of an eruption. Dr. Jaggar proposes that a laboratory be built 13,000 feet above sea level on Mauna Loa.

On the less scientific side, he wants a jeep road from Kilauea to Mauna Loa summit house "so that there will be no more lost airplanes, no more pack trains of horses caught in blizzards of sleet and snow and so that science and public can see a Mauna Loa outbreak."

Dr. Jaggar also believes that studies of Mauna Loa and other volcanoes must go down as well as up. He would like to see the Navy make a survey of lava flows under the Pacific east, south and northwest of Hawaii Island where Mauna Loa is.

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CONSERVATION

Resources Conferences Scheduled at Lake Success

➤ CONSERVATION and development of the resources of all parts of the world will be discussed at a United Nations Scientific Conference on the Conservation and Utilization of Resources to be held at Lake Success, N. Y., from Aug. 17 to Sept. 6.

Originally proposed by President Truman, this meeting is being called by the United Nations Economic and Social Council. Engineers, economists, scientists and other experts will be invited to participate in UNSCCUR, which is the short name given the conference.

At the same time, UNESCO is assembling another conference jointly with the International Union for the Protection of Nature. Sessions of both conferences will be held during the same period as many experts will participate in both.

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GENERAL SCIENCE

Films May Bring Science to War-Devastated University

➤ A PLAN for bringing great scientists and elaborate experiments with costly equipment to classrooms in war-devastated universities has been proposed to the United Nations Educational, Scientific and Cultural Organization.

Schools without funds for expensive classroom science equipment can use films to show their students the experiments which cannot be performed for them. This is the idea that came to Dean Vidal Tan of the College of Engineering of the University of Philippines, when he saw in the United States audio-visual films of science experiments.

Dean Tan was in the U. S. on a UNESCO reconstruction fellowship studying educational administration.

"Scientists of world repute and statesmen of international fame may be seen and heard through the audio-visual films, furnishing inspiration and stimulus heretofore beyond our modest reach," Dean Tan explained in a letter to UNESCO headquarters in Paris.

"It is relatively inexpensive and will surely vitalize instruction, especially in the courses where our economic handicaps prevent us from acquiring expensive and elaborate equipment."

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IN SCIEN

PHYSICS

Atomic Bomb in the Hand Is Worth Many Death Rays

➤ AMERICAN military scientists are not greatly alarmed at German reports that the Soviets have made progress with "death rays."

One reason is the proven power of atomic bombs. Death rays have been dreamed of for years. Some scientists and many non-scientists have thought they had one. But no real death ray has ever been found.

A scientist assigned to investigate the death rays proposed by American inventors during the last war came up with a blank. Only death ray casualty he found was a canary cooked to death at a distance of nine feet.

Heat is a favorite subject for death ray designers. A leading U. S. military scientist tells this story of one such ray:

A pair of German scientists were experimenting with the infrared rays which are found in sunlight and emitted by such things as stoves. The scientists were not sympathetic to Hitler and wanted to continue their peaceful research despite the war. So, they sold Hitler's science leaders on the idea of an infrared death ray.

Their infrared rays produced heat and no deaths. But they were able to continue their research under the guise of developing a death ray.

Now that atomic bombs have been made, the old search for a death ray is more difficult. It will have to be able to compete as a weapon with the A-bomb.

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PLANT PHYSIOLOGY

Polarized Infra-Red Light Changes Starch into Sugar

➤ STARCH grains can be chemically broken down and converted into sugar by infra-red "black light" reflected in such a way that it becomes polarized, having all its wave-fronts vibrating in the same plane. This has been demonstrated at the Chelsea Physic Garden in London by Dr. Elizabeth Sidney Semmens.

Source of the infra-red rays in her experiments was an electric heating coil. The reflecting surface was either black glass or a ferrotype plate, such as is used by photographers in finishing their prints.

Dr. Semmens has for some years worked on problems connected with the conversion of starch into sugar under the influence of polarized light. Her present results are described in a letter to the editor of the British Journal, NATURE (March 5).

Science News Letter, March 19, 1949

NCE FIELDS

RADIO

Higher Power for Radio Given by Diplexer Network

➤ HIGHER power for radio broadcasting is obtained by a system which allows two transmitter tubes to be operated simultaneously into a common load without interaction between tubes and without reduction in bandwidth, the Institute of Radio Engineers was told in New York by four scientists of the Radio Corporation of America.

These research men from the RCA Laboratories at Princeton, N. J., described what they called a diplexer, a combining network which is applicable from powerline frequencies through at least the ultra-high frequency band. It is a combining network for tying the output of two transmitters into a single antenna which works out to be a simple means of doubling the power output. They emphasized that the network does not combine tubes, but combines their output.

The continual struggle in radio broadcasting is for higher power, the scientists stated. They are G. H. Brown, W. C. Morrison, W. L. Behrend and J. G. Reddeck. The ultra-high frequency band is no exception, they continued; the only difference is the increased difficulty in getting it. Tubes capable of high power have been developed, but still higher power is desired. This two-tube network promises a solution.

In it, two transmitters can be combined with one diplexer, which can then be considered as a single unit. Another two transmitters combined with a second diplexer form a second unit, and then the units can be used with a third diplexer to give four times the power of a single transmitter. The process can be continued as desired, always doubling the number of transmitters and the output power.

Science News Letter, March 19, 1949

ENTOMOLOGY

Insects Anesthetized for Experiments in New Gadget

➤ FOR the micro-surgical operations which entomologists sometimes want to perform on insects, Edwin R. Willis and Louis M. Roth, of the U. S. Quartermaster General Laboratories in Philadelphia, have devised a convenient operating stage on which their small experimental subjects can be kept anesthetized as long as they need to work on them.

The device consists of a rectangular block fitting on the stage of the dissecting microscope, with a circular depression cut into it. Slightly above the bottom of this is a fine screen, held in place by a plastic ring. On this the insects are placed.

Carbon dioxide is the anesthetic gas used. Insects exposed to it quickly become motionless, and can be worked on in any way desired without "kicking up a fuss". Micro-operations on such insects as clothes moths, flour beetles and mosquitoes help scientists to find out what makes them tick—with the ultimate objective of making millions of them stop ticking.

The scientists have reported their new device to the journal, SCIENCE (March 4).

Science News Letter, March 19, 1949

RADIO

One Antenna Can Feed Several Receivers

➤ AN electronic device called a multicoupler, which enables one antenna to supply signals to several receivers, was described to the Institute of Radio Engineers in New York by W. R. Aylward and E. G. Fubini of Airborne Instruments Laboratory, Mineola, N. Y. It is usable where for lack of space only one antenna can be erected. It is a situation common in receiving stations in the armed services, and in aircraft.

Science News Letter, March 19, 1949

AERONAUTICS

Miniature Airport Tests Plane Models Successfully

➤ A MINIATURE airport in operation for the past year at the Wright-Patterson Air Force Base in Dayton, O., has served successfully as a test ground for flying models of airplanes in obtaining pre-flight data.

The tiny airport has a circular runway 400 feet in diameter. In the center is a pylon, actually a control line base tower, for flying the models. Strong thin wires connect to the model's control surfaces, enabling an operator on the ground to fly it as he would a full-sized plane.

While their movements are limited to a single axis, these control-line type models yield rationalized, proportional control data more nearly simulating actual flight control problems than do the radio-controlled type of models, Air Force officials state.

The tests are filmed by a camera which, riding the pylon cable, follows models through all maneuvers and speeds, maintaining continual photographic contact at a constant distance. The models tested are exact copies of the plane under study, and are from seven to 18 feet in length.

At present, the models fly up to 200 miles per hour with tiny conventional engines. Plans, however, are underway to operate them at transonic and supersonic speeds, utilizing rockets and jet engines. When this is achieved, extensive experiments will be made in the critical speed range.

Science News Letter, March 19, 1949

MEDICINE

Allot Funds for Research On Polio Viruses

➤ HOW MANY different viruses capable of causing infantile paralysis are there? How do the numerous polio viruses differ and what are their characteristics?

Answers to these questions, important if vaccination against polio ever can be achieved, are being sought in a new research venture financed by $1,370,160 of March of Dimes funds from the National Foundation for Infantile Paralysis. Cooperating in the three-year study of this phase of the polio problem are the Universities of Southern California, Kansas, Utah and Pittsburgh.

Infantile paralysis, or poliomyelitis, is now considered not a single disease but a family of diseases, with certain common symptoms, caused by two or more groups or families of viruses, Dr. Harry M. Weaver, director of research for the National Foundation, explained.

The specific problems which the research scientists at the four universities must answer are: 1. What are the differences between the polio viruses isolated in different geographic areas and in different epidemics? 2. Is there any detectable difference in viruses isolated recently as compared with those isolated in the past? 3. Is there any detectable difference in the viruses isolated from healthy carriers, non-paralytic and paralytic patients?

This and other research and educational projects involving March of Dimes funds in excess of $2,500,000 were announced by Basil O'Connor, president of the National Foundation for Infantile Paralysis.

Science News Letter, March 19, 1949

WILDLIFE

Big American Elk Gains, Thanks to Its Bigness

➤ ONE of the nation's big-game animals seems to be increasing in numbers because it is big.

The wapiti, or American elk, now numbers an estimated 226,500, compared with a low population of 50,000 a few decades ago, the North American Wildlife Conference was told in Washington.

Reasons for this increase include the animals' size, explained D. I. Rasmussen of the U. S. Forest Service. The wapiti is large enough to resist predators and compete with other animals for food. Also in the animal's favor is the fact that it responds well to management practices.

Less encouraging was the report on a famed and unique species of the North, the caribou. A. W. F. Banfield of Canada's Dominion Wildlife Service said that inroads of civilization left the status of the caribou "precarious."

Science News Letter, March 19, 1949

GENERAL SCIENCE

Science and Humanity

The universality of science proves that mankind is indivisible and the sole criterion is human need, young scientists were told at the Awards Banquet.

By BASIL O'CONNOR

President, American National Red Cross and the National Foundation for Infantile Paralysis

Address delivered at the Awards Banquet of the Science Talent Institute in Washington, D.C., March 7.

➤ SIR William Osler once had occasion to remark rather caustically on the comparative uselessness of men over 40 years of age. I need not say that this distinguished scientist was considerably embarrassed to find that his observation was later misinterpreted by an over-eager press that reported "Dr. Osler recommends chloroform for men over forty."

So, if tonight I pay tribute to deserving youth, I sincerely hope you young ladies and gentlemen will not carry away with you the impression that I advocate liquidation or compulsory retirement for all who attain middle-age. I need not tell you that my own position would be rather precarious in such circumstances.

Potential Scientists

The Eighth Annual Science Talent Search culminates tonight in the recognition of you 40 young people as the top potential science talent of the nation's high schools. You are here because the sponsors of this search are convinced that each of you has the ability, the ambition and the enthusiasm to make the most of an education in the field of science. And you probably anticipate from me something in the nature of a "pep talk" as my contribution to the occasion. I think I shall disappoint no one if I confess my sincere conviction that youth needs no pep talk, and that you, in particular, who have survived obstacles deliberately placed in your path to test your tenacity and determination, are in no immediate need of verbal stimulus.

It may seem strange to you that a layman, such as I, should be called upon to address the 1949 finalists in the Science Talent Search. I can regard it largely as a compliment to the distinguished welfare organizations that I have the privilege of representing. Beyond that, I take it as a recognition of the universality of science. There is no living individual whose life is not in some way related to the world of the test tube and microscope.

Obviously, connected as I am with the American National Red Cross and with the National Foundation for Infantile Paralysis, I have been greatly interested in the promotion of research in the broad field of public health and in the particular field of a specific disease. Therefore, my claim for inclusion in the select company which you scientists of today and tomorrow form is largely by osmosis.

In a sense this occasion has the flavor of a commencement program. You 40 young men and women are, one might say, the graduating class of a science institute, made up of thousands of students all over the nation. The temptation of your speaker of the evening is to put the finger on you, as countless other commencement speakers have pointed to the graduates as the "hope of the nation," yea, verily, "the hope of the world." According to the age-old formula, we oldsters have failed completely and the future is in your hands. That's what I was told when I came out of high school. That's what I was told when I was graduated from college, and that is what I was told when I finished my course in law school.

I think the problems that face youth today are the problems which face *all* of us. We are all in the same boat, young and old, rich and poor, believer and non-believer —American, Russian, French, British, Chinese and the whole catalogue of human kind.

Never in the world's history has so much knowledge been entrusted to mankind in such a compressed period of time. The sciences I studied are in the realm of archaeology today. In our time the secrets of the universe have been unlocked on a scale that dwarfs the accomplishments of the ages.

Scientific Development

I shall not attempt to review the advances which have been made, for they are far better known to you young people who discuss the intricacies of science with a facility which shames your elders. We have reached a stage in our scientific development that staggers the imagination, with its planes traveling faster than sound, with its billion electron volt cyclotrons, with its rockets, and even the utterly fantastic, but serious proposal, for creating artificial satellites of the earth.

Man has unlocked Pandora's box and is learning fast the arts of mass destruction and of the ultimate annihilation of civilization. If one were inclined toward pessimism, it would be easy to conclude that the age of the Frankenstein and the robot is at hand.

In my work with Red Cross, I've visited many countries around the world. I've found that people may differ in looks, in beliefs, and in habits of living but, basically, their hopes and their needs are pretty much the same. To be sure, there's suffering and hate, but there's also unselfishness and the will to struggle on.

That's why I don't believe today's voices of doom which say we're nearing the end of our civilization. Will we be destroyed by our own scientific advances? Will we, too, go the way of ancient Egypt, and the Empires of Greece and Rome?

Arnold J. Toynbee, the eminent historian, says the choice is up to us. Says Toynbee: "Although sixteen great civilizations we know about have perished, we today are *not* compelled to submit the riddle of our fate to statistics."

Yet statistical pessimists point out that man first extended his arm with a sword; then to a gun which would hurl missiles for many miles. But we should remember that that same man extended his arm also to paint pictures, to write words, to build schools and churches.

Man's Progress

That same man first projected his voice through war trumpets; but he also sent it through radios which carry not only his voice but his magnificent music and drama as well. That man also lengthened his legs with wheels, then the wheels grew wings and turned into planes to carry his bombs. But these same planes carry food, medicines, and trade cargoes to the needy around the globe.

Yes, man, through science, has greatly extended his physical universe. But what we must come to realize more fully is that if this world is to have that meaning which gives it value, then man must extend his human spirit even farther. I think that is the choice to which Mr. Toynbee refers.

It is true, of course, that the evolution of sensate society as we know it, has been a steady march forward. Every setback has taught us lessons that have advanced material civilization. Out of the horrors of war have come some of our greatest medical advances. The very creations of war have found their place in the orderly processes of living.

No one will seriously dispute the fact that scientific research has played its part to an extraordinary degree in man's progress. The horizons of knowledge have been extended almost limitlessly. With knowledge has come power—great power. But power for what?

Power for bigger and better atomic bombs?

Power for deadlier bacteria and gases?

Power for controlled missiles that will strike with devastating effect on civilian communities, bringing death to innocent women and children?

Power to conquer by land, sea and air

those whom we fear or those who threaten us?

I do not wish to be understood as suggesting that we should not have a strong America in the face of present conditions. But I *do wish* to assert emphatically that the arts of peace must go forward even more vigorously than the arts of war if this world is to be of the nature we continually claim for it.

It is in this respect that I think the young scientists of today share with those who have lived longer, a tremendous responsibility.

Let's have no nonsense about the superiority of one race as against another. I hope *that* myth has been exploded for all time. There is no such thing as American science or French science or English science or Soviet science. There are those who for ideological reasons would have us believe that science is doctrinaire and related to a particular form of society. This too is sheer nonsense and can lead to only a fatal conclusion.

Freedom of Inquiry

Such a concept of science can exist only in an unscientific atmosphere of restraint and repression. When such a condition exists, in any nation, that nation is on the path to self destruction. Such thinking finds expression in the suppression of the rights of the individual. It denies the basic freedoms of a free society. It destroys the right of freedom of inquiry without which there is no science or man of science.

You young men and women, who have been singled out for distinction, share with the rest of us the responsibility for insisting on freedom of inquiry. In a world that is moving too rapidly for many, many people and one, therefore, beset in many places with much suspicion, you will find that even in some of our own academic halls resort is frequently had to the mechanism of repression. I need not urge you to combat vigorously such a condition whenever you encounter it. Unless you do and unless you are willing to participate in those activities that may be necessary to protect our basic freedoms, you will find the search for truth easy of accomplishment because you will be compelled to find as the truth what has already been ordained as truth by others.

We must never forget the world of science is one world. Before the present era of strife and suspicion, it was the rule for scientists of one nation to share their findings with those of another. Witness the field of nuclear physics and all that we know about the atom. Our knowledge springs from the work of the Englishman, Rutherford; the Dane, Niels Bohr; the Italian, Fermi; the French, Joliot-Curies; the Americans, Lawrence and Urey and Oppenheimer; and from the mind of one of the greatest of scholars, Einstein, a refugee from Germany.

The pages of history are filled with similar scientific advances. It proves the universality of science. It proves that while the atom is divisible, mankind is not.

No, mankind is indivisible. There is only one mankind. There may be good or bad individuals, but as Burke said many years ago. "I do not know the method of drawing up an indictment against an whole people."

You young men and women who have been singled out for distinction have the responsibility for taking a stand against the artificial barriers erected between individuals or groups of individuals because of their race, creed, color or national origin. If you are true to the knowledge you have acquired, you know that there is no scientific justification for the inherent superiority of one group over another. No, mankind is indivisible.

It is one of the most heartening signs of our times that this truth is finding expression in the great voluntary welfare organizations of our own country and in countless similar movements throughout the world. On every hand we find men and women banded together in a spirit of compassion and dedicated to the relief of human suffering. The sole criterion is human need. Such an organization is the American Red Cross with its 18,000,000 members in every section of our land. As a part of a worldwide movement, with societies in 68 countries, it enlists under its banner some 100,000,000 members.

Science plays an important part in the merciful work of the Red Cross. Many of the Red Cross programs in our own country are concerned with the health of our people.

National Blood Program

One of the most important undertakings of the American Red Cross is our new National Blood Program. Science is responsible for our present knowledge of the use of blood in the care of the sick and injured. From the horrors of war we learned much more of the miraculous healing power of blood and its products. The great scientific advances made in the past decade in our knowledge and use of blood in medical practice is one of the invaluable scientific advances of our age.

I think it is appropriate on this occasion to reveal, that for the first time in medical history, work is in progress that will permit the isolation of pure portions of the blood, both the living cellular elements like the red blood cells, the white blood cells and the platelets, as well as the fractions of liquid plasma. In the thirty years or more of collection and banking of blood for human use there has been very little appreciation of the fact that the moment blood is withdrawn from the body it no longer has the protection of the circulation within the body. Various portions of the blood begin to die off at different rates and in turn affect the usefulness of each other.

For example, the blood platelets probably undergo degenerative changes almost immediately when withdrawn from the body. The white cells are probably dead or destroyed within a matter of a few hours. Each of these in turn liberates products, seriously interfering with the usefulness of the remaining natural blood constituents. This may explain why red blood cells, the most hardy and long-lived of the cellular elements, with a life expectancy in the body of three to four months, even under the best of conditions obtained in the past, have rarely lived more than 30 days ouside the body.

The newer advances, for the first time, are showing methods of separating these constituents of the blood almost immediately, so that they cannot adversely affect each other. This offers the promise of giving us each element in its natural, pure, unadulterated form. This will permit physicians to use blood not only much more economically and specifically, but for much longer periods of time. This startling development is of vital importance to civilian practice in medicine as well as to military practice, where stockpiling of blood and its products are so essential for emergency use.

Threshold of New Era

In short, the brilliant work of scientists has brought us to the threshold of an entirely new era in understanding how to separate the important components of the blood and to use each in the methods that will serve best in the saving of life, in alleviating human suffering and prevention of disease.

You will be hearing more of this epochal scientific advance. I mention it for two reasons: first, it emphasizes my earlier observation, that despite the destructive effect of war on science and civilization, scientific research born of war has played its part to an extraordinary degree in man's progress.

Secondly, it relates directly to the opportunities which lie ahead for young men and women embarking on a career in the realm of research.

I learned of this significant development a short time ago at Harvard University, when I acted as host to a group of about 150 scientists, called to a meeting jointly sponsored by the Red Cross and government and other agencies interested in blood and blood derivatives.

As I rose to welcome these men and

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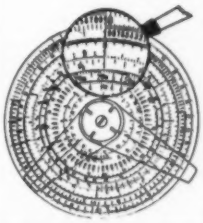

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women to a dinner gathering, I could not help noting how many young faces there were before me. In this large gathering of top-flight scientists, invited from all over the country to discuss what is known about our blood, particularly how to collect it better, preserve it better, and use it better, there was a high proportion of "youngsters."

Many of them were biochemists who had set out to study the nature of certain enzymes in the body fluids; others were interested only in the chemistry of non-wetting agents which keep body cells from sticking to glass, rubber and other surfaces; still others were physicists who had been exploring the effects of intense cold—from liquid air or liquid oxygen—on body cells, like the red blood cells; some were plastic engineers, developing the possibilities of amazing new and often unexpectedly useful compounds which can replace our old-fashioned wood, glass, rubber, and metal; many were physicians anxious to try new methods of relieving human suffering and curing disease.

Young Ideas

What did all these people have in common and how did they happen to be gathered together, from their widely diverse original fields of interest? They all had youthful enthusiasm, innate curiosity and skepticism of the too-readily accepted practices of the past. Even the older participants in this conference had young ideas, scientifically speaking.

For this is how humanity progresses, in every field of endeavor. The young mind re-explores the established principles and picks up the flaws previously overlooked. Or starting off on a tangent, in pursuit of some original idea that may have no obvious practical application or intrinsic value, suddenly ends up with an amazing basic contribution to the art or the science of better living.

It is obviously important to the welfare of the human race that each generation be permitted to contribute its full share of talented young minds, without interference by war, famine, disease, or that latest of scourges, totalitarian muzzling of human expression and individual initiative. Young and inquiring and eager spirits must be encouraged by inexpensive educational opportunities, obtained through merit, to delve into whatever fields they find interesting, whether these seem of immediate practical application or not.

Let me remind you that many great scientists made a major impact upon research during their early adult years. Laennec invented the stethoscope when he was but 34 years old. Jenner was still in his 20's when he discovered how to prevent that dreadful plague, small-pox. Claude Bernard, the father of modern physiology, was only 30 when he first reported on his important studies on the liver. Einstein produced his first paper on relativity at the ripe old age of 26. Many of the great contributions of Niels Bohr were completed while he was in his early thirties, and Paul Ehrlich, who discovered how to stain blood cells and in so doing revealed a method for identifying many of the diseases of the blood, was only 23 when his basic discoveries were made.

Nobel Prizes in Blood

As you know, within the past two decades Nobel prizes have twice been awarded for researches relating to blood. In 1930 Landsteiner won the coveted award for his discovery of the four human blood groups. In 1934 Minot, Murphy and Whipple received this scientific recognition for their researches on that hitherto invariably fatal blood disorder, pernicious anemia.

I venture to predict that another Nobel prize, or even more than one, will, some day, be awarded for research on blood. It may well be that the winner will be one of you Science Talent Search finalists.

But this is not your only opportunity, as you well know. To mention another of my interests, the isolation of the virus that causes infantile paralysis and the development of a preventive for this disease, predominantly of little children, is but another of the problems facing the scientist of today and tomorrow.

Humanity calls on science to solve its most pressing problems that relate to better living in a better world.

A prerequisite is that there should be willing minds and hearts to undertake the tasks which lie ahead. It is significant that over a long period of years a great industrial corporation, Westinghouse, and one of America's leading educational and scientific organizations, Science Service, have joined hands to discover the creative scientific abilities of our nation.

You are their discoveries.

I congratulate you young men and women who have been selected as likely to carry forward the torch of science. To you and the thousands of your fellow scientists, in schools and science clubs throughout the world, I say—"Well begun!"

Opportunities for Youth

Before you lies an era of unparalleled opportunity and unparalleled responsibility. Together with those who have been working before you, you face the challenge to produce new foods from the sea, to battle the uncontrolled rain drop which is robbing the good earth of its nutrients, to harness summer's sun for man's year-round use, to fight disease and death with amazing new medicines.

Your opportunity goes beyond the confines of our own land. You will recall the historic fourth point in President Truman's Inaugural Address. He said: "We must embark on a bold new program for making the benefits of our scientific advances and material progress available for the improvement and growth of under-developed areas.

"More than half the people of the world are living in conditions approaching misery," the President said. "Their foods are inadequate. They are victims of disease. Their economic life is primitive and stagnant. Their poverty is a handicap and threat both to them and to more prosperous areas."

The President stated further that for the first time in history, humanity possesses the knowledge and skill to relieve the suffering of these people.

If you had any doubt that opportunity awaits you, I am sure these words of our President would be reassuring. With your help the American ideal can offer man some dignity and some chance for self-improvement.

And, remember, that the American ideal cannot be saved by the sword. It can exist and have value only if we *live it* every hour of every day, and by our own example make it such that peoples everywhere will of their own accord seek the opportunity of embracing it.

Science News Letter, March 19, 1949

Plastic Coasters and Tiles

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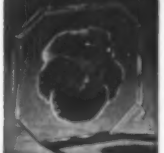

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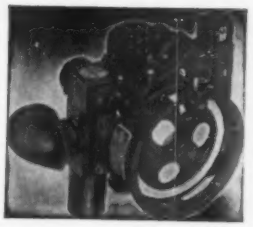

These Army Air Forces Bubble Sextants costs the Govt. about $125.00 each. A real bargain at our price at $12.50! Wooden carrying case included. Also auxiliary items. Wartime used. **BUT COMPLETELY REPAIRED COLLIMATED AND PUT IN GOOD WORKING ORDER.** If not satisfied that Sextant is exactly as represented, return within 10 days for refund. Full directions for use accompany each shipment.

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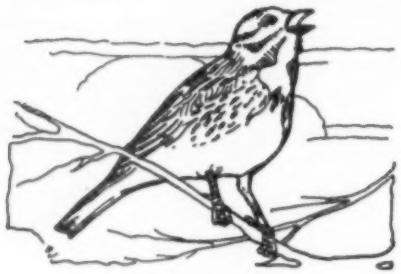
ORNITHOLOGY

NATURE RAMBLINGS

by Frank Thone



Utilitarian Song

➤ SPRING bird songs have already filled the air where winter has retreated, and will soon be heard to the northern boundary and up the highest mountains. There have been robins and red-winged blackbirds; presently there will be wrens and bluebirds, thrushes and orioles.

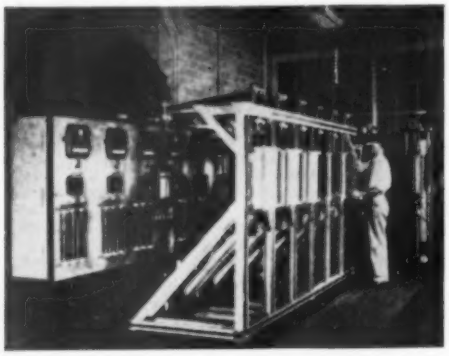
Romanticists of all schools have for centuries rhapsodized over the sweet songs of birds, hailing them as "nature's troubadours" and all that sort of thing. Since many bird songs do sound very sweet to human ears, it is only natural for us to suppose that birds sing for the same reasons that we do: that they are feeling happy, or want to attract favorable attention to themselves, or are trying to please their friends or offspring. Such "anthropopsyching" is a mental groove very easy to slip into.

However, more objective observations made by cooler-brained field scientists seem to indicate that birds do not necessarily sing through sheer exuberance of feeling or from love of mate or family. Certainly the first song-outpourings we hear in spring can not come from such causes, for neither families nor nests exist as yet, and even the prospective mates have not yet put in their appearance. First bird songs are heard only by males.

The reason is highly utilitarian. Practically all song birds migrate in waves, with the males traveling in advance of the females. Upon arriving at an area that promises to supply good hunting for the prospective nestlings, each male bird picks out a tract that will supply his family's needs. Then he proceeds to stake claim to it by perching in some prominent place and singing as loudly as he can. However pleasant his song may sound to human ears, it is probably disagreeable to a later-coming male, for it warns him, in effect: "This territory is mine; move on or prepare to exchange buffets!"

Bird song as an expression of bird pugnaciousness reaches an easily observed climax when a cat gets near a wren house. Between furious lunges at Tabby's bewildered head, the wren will perch on a twig and sing as if to burst his throat. And when the furred ogre has slunk away he will sing again, for as much as a half-hour. Just like that equally assertive though less tuneful male—the rooster.

Science News Letter, March 19, 1949



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WILDLIFE

Winter-Killed Animals Mean More Coyotes and Buzzards

➤ COYOTES, buzzards and other predators and scavengers will find rich pickings for a while after melting snows in the West lay bare the carcasses of livestock and game animals and birds killed in this winter's terrific blizzards. This grisly clean-up job will be a service to human inhabitants of the land, but at the same time it will help produce a bigger population of these prowlers, Frederick C. Lincoln of the U. S. Fish and Wildlife Service stated.

This is because there will be a much bigger than ordinary supply of food for the coyote cubs and the nestlings of the buzzards and crows, Mr. Lincoln pointed out. A higher percentage of them will survive and grow up, to hunt hungrily for food next winter. And because the breeding stock of deer, sage grouse and pheasants has been severely reduced, along with the livestock losses, next winter is likely to be a hard-times season for the predators.

This in turn will bring about an increased number of predator raids on domestic animals, especially sheep, he continued, adding: "We shall not be surprised if stockmen make more demands on us for the services of our hunters."

Science News Letter, March 19, 1949

ENTOMOLOGY

Biological Warfare Tested Against Insect Foe in West

➤ BIOLOGICAL warfare methods are being tested against enemy hordes in California. The enemy is the alfalfa caterpillar, and the weapon used against it is the virus of a wilt disease that apparently affects no other insect and is known to be harmless to man and his animal dependents.

Sprayed on the fields where the caterpillars are feeding, the virus produces a sweepingly fatal epidemic. In one test plot, the number of active caterpillars was reduced to four, while in an unsprayed control plot the number rose from 96 to 154 in 11 days. Further tests are being made.

Science News Letter, March 19, 1949

Words in Science—TRANSISTOR

➤ AN invention which will make possible more rugged radios is the transistor, pronounced tran-sis-tor, with the stress on "sis."

The transistor may very well in future be the successor to the vacuum tube. It is a bit of semi-conducting germanium metal that amplifies or oscillates current without the complexity of plates and wires in an airless bulb.

The transistor will be a small instrument, slimmer than a pencil and less than an inch long, making possible smaller radios. The conductivity of a semi-conductor, such as germanium, is controlled by changing the electronic structure of a small bit of material under the influence of the incoming current, fed to it through a fine wire.

Science News Letter, March 19, 1949

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WYOMING

Ride, fish, geologize or just relax. Now?

Paton Ranch will give you trout fishing in a mountain stream as it flows out of a canyon in the Big Horn Mountains, daily horseback rides along the picturesque trails and excellent food—most of which is grown on the ranch.

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• Books of the Week •

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ALBERT EINSTEIN—Elma Ehrlich Levinger—*Messner,* 174 p., illus., $2.75. A delightful biography about a great scientist who also is a human being with feelings. Although primarily for young people, it certainly is a charming book which adults will also enjoy.

THE AMERICAN ANNUAL OF PHOTOGRAPHY, Volume 63—Frank R. Fraprie and Franklin I. Jordan, Eds.—*American Photographic,* 240 p., illus., paper, $2.00. (Cloth, $3.00.) Another beautiful edition of this popular photographic annual including a Who's Who in Photography.

THE BASS-BLUEGILL COMBINATION IN A SMALL ARTIFICIAL LAKE, Volume 24, Article 3—George W. Bennett—*Illinois Natural History Survey,* illus., paper, free upon request to publisher, Urbana, Illinois.

THE BATTLE OF THE CONSCIENCE: A psychiatric study of the inner working of the conscience—Edmund Bergler—*Washington Institute of Medicine,* 296 p., illus., $3.75. An investigation into the working ramifications of the conscience and also the technique of neurotic appeasement of the unconscious part of the conscience.

CAREERS IN ENGINEERING AND SCIENCE—*Polytechnic Institute of Brooklyn,* 66 p., illus., paper, free upon request to publisher, 99 Livingston Street, Brooklyn. This booklet is intended chiefly to inform prospective college students with the field of engineering and science.

DISCRIMINATION AND NATIONAL WELFARE—R. M. MacIver, Ed.—*Harpers,* 135 p., $2.00 The main theme of this series of 11 lectures is that there are serious and unrecognized costs in our discrimination policies. Such topics as segregated areas, housing restrictions, discrimination in education, and in the churches are discussed.

HUMAN RELATIONSHIPS IN PUBLIC HEALTH: Report of an institute on mental health in public health.—Geddes Smith—*Commonwealth,* 18 p., paper, fifteen cents. An objective discussion of health problems with the emphasis on the mental field by a group of psychiatrists and students of public health.

INTRODUCTION TO TOPOLOGY — Solomon Lefschetz—*Princeton University Press,* 218 p., illus., $4.00. Emphasis on results rather than techniques. For the graduate student in mathematics.

LIBERTY HYDE BAILEY: A story of American Plant Sciences—Andrew Denny Rogers, III —*Princeton University Press,* 506 p., illus., $7.50. Although centering on the life of Liberty Hyde Bailey, this superb biography is also the story of the development of plant sciences. Indeed a fine tribute to the grand old sage of plant science.

LITTLE BEAR CREEK SITE CT° 8: Alabama Museum of Natural History paper 26—Wm. S. Webb and David L. DeJarnette—*Geological Survey of Alabama,* 64 p., illus., paper, ten cents. An archaeological report of Colbert County, Alabama, showing the results of excavations which took place in 1939.

THE MENTALLY ILL IN AMERICA: A history of their care and treatment from Colonial times —Albert Deutsch—*Columbia University Press,* 555 p., illus., $5.50. A new edition of an earlier work tracing the development of thought about the so-called insane. The author has added a description of many of the advancements made during the past decade and also he has included a review of recent trends toward the prevention of mental diseases.

MUST WE HAVE FOOD SURPLUSES?—Agriculture Committee Report—*National Planning Association,* No. 66, 46 p., paper, fifty cents. A pamphlet on what to do with food surpluses. In question and answer form.

OVERSEAS INFORMATION SERVICE OF THE UNITED STATES GOVERNMENT—Charles A. H. Thomson—*Brookings Institution,* 397 p., $4.00. An analysis of the main issues and problems arising out of our decision to maintain a peace time information service to foreign nations. A detailed history of the operations of the information services.

PERMIAN CRINOID CALCEOLISPONGIA, Memoir 34—Curt Teichert—*Geological Society of America,* 132 p., illus., $2.50. A profound and authoritative study on the subject of *calceolispongia* in Australia. A vast amount of information which is organized and presented very well. Excellent illustrations.

THE PERRY SITE Lu °25: Alabama Museum of Natural History paper 25—Wm. S. Webb and David L. DeJarnette—*Geological Survey of Alabama,* 69 p., illus., paper, ten cents. A report made from the excavations made in Lauderdal County, Alabama. Among the many things studied are dog burials, burials, pottery, and shells. The important thing about this report is the finding of a shell mound.

THE PROBLEM DRINKER—Joseph Hirsh—*Duell, Sloan & Pearce,* 211 p., illus., $3.00. A factual and clear analysis of the psychological problems which alcohol creates.

SEX AND YOU—LeMon Clark—*Bobbs-Merrill,* 203 p., $2.75. For the married or about to be married a good and wholesome introduction into the many problems of sex. A frank and down-to-earth approach to such problems as sex attitudes, marriage, pregnancy, and divorce.

SOCIAL MEDICINE: Its Derivations & Objectives —Iago Galdston, Ed.,—*Commonwealth,* 294 p., $2.75. A symposium written to celebrate the 100th anniversary of the New York Academy of Medicine on the significance of social medicine.

THE STORY OF TELEVISION: the life of Philo T. Farnsworth—George Everson—*Norton,* 266 p., illus., $3.75. The interesting and dramatic story of an inventor of television. Written in simple style, the fundamentals of sending pictures through the air are clearly explained. Good background material.

SUICIDE AND THE MEANING OF LIFE—Margarethe Von Andics—*William Hodge* (Lond.), *Sherwood Press distributor,* 219 p., $3.00. The author is credited with being the first to introduce the psychiatric method of investigating life histories as a method in psychology. The book, which is written from a scientific point of view rather than the time-honored philosophical one, is a new approach to the old problem of what is the "meaning of life."

Science News Letter, March 19, 1949

Science Service Radio

➤ LISTEN in to a discussion on "Balancing Food and People" on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p.m. EST, Saturday, March 26. Gove Hambidge, adviser to the director-general of the Food and Agriculture Organization of the United Nations will be a guest of Watson Davis, director of Science Service. Mr. Hambidge will discuss one of the world's major problems that is receiving so much attention in postwar days.

Science News Letter, March 19, 1949

In extensive, unfenced forest areas, so-called *boundary-line paint* is sometimes used on trees to mark the property of individual owners.

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• New Machines and Gadgets •

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CLOTHESLINE for permanent placement in the basement, the braided-wire type, is easily made taut by means of two wire tighteners with thumb nuts. The wire is supported at each end by a strip of rustproof metal fastened to project below a floor beam and braced with another strip of metal.

Science News Letter, March 19, 1949

NAME TAPE, to identify clothing at camps and schools, has a thermoplastic backing which, after ten seconds under a hot flat-iron, makes a permanent bonding to the garment that cannot be separated by washing or wearing. A name can be printed with color-fast dye on the white cotton tape.

Science News Letter, March 19, 1949

REEL for the fisherman to carry a supply of knotless leader in his pocket is made of two disks of transparent plastic just far enough apart to permit holding the line wound within it. It is made of an orange fluorescent material which glows in the dark, and will float if dropped in the water.

Science News Letter, March 19, 1949

DICTAPHONE RECEIVERS, for the typist transcribing records, are positioned in front of the ears as shown in the picture. The sound is piped to the ears by means of sound arms on ball-and-socket joints

which may be inserted into the ear or placed an inch away. Only one may be used if desired.

Science News Letter, March 19, 1949

GARMENT BAG, for the corner of a crowded closet, is square in shape, made of a transparent plastic material which hangs from a specially designed frame, and has a long zipper which opens on the side instead of on the front. A patented stay-open device leaves both hands free to insert or remove clothing.

Science News Letter, March 19, 1949

ARTIFICIAL SEAWATER may be had in a swimming pool by the addition of a package of chemicals which contains all the ingredients of natural seawater. For a pool owner who wants a distinctive color in the water, salts are available in tones of blue, green and purple.

Science News Letter, March 19, 1949

SCAVENGER BOAT for New York harbor, picks up loose debris and floating driftwood. It is a 100-foot craft with a double pontoon-like hull, and is diesel-powered with twin screws and twin rudders. When cruising through the harbor, it picks up any debris encountered.

Science News Letter, March 19, 1949

FOLDING GLASS, for a convertible automobile top, folds like an accordion on a three-quarter-inch plastic joint connection when the top is lowered. Its use eliminates the narrow rear-vision strip formerly necessary and permits the same full-vision view as in stock model cars.

Science News Letter, March 19, 1949

Do You Know?

Ethyl ether is an important solvent for fats, oils, waxes and gums.

Farmers can not expect increased yields from *radioactive materials*, tests in 1948 made with 18 crops in 14 states indicate.

One process of obtaining *nitrogen* for industrial applications consists of burning the oxygen of air with hydrogen, leaving nitrogen as a residual gas.

What is known as the *Klamath weed*, common in the Klamath Valley, California, causes the white-skinned parts of the bodies of sheep that eat it to become sensitive to sunlight, with resulting blisters.

Benzene hexachloride, known as BHC, is an effective *insecticide* now widely used; the chemical was discovered over a century ago but was not used for bug-killing until a Frenchman, eight years ago, noted that it destroyed clothes moths.

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